



Salt Division

12 September 1989

John Malleck
UNDERGROUND INJECTION CONTROL SECTION
USEPA Region II
Jacob K Javits Federal Building
New York, NY 10278

Dear Mr. Malleck:

Plugging and abandonment plans are enclosed for Brine Wells 27, 28, 30, 31, 37, 45, and 46 at the Akzo Salt Inc., Watkins Glen, New York salt refinery. Well specific procedures are included for each well.

Well 37 was previously used for brine production and has reached the end of its useful life. The other wells listed are entries into two salt caverns previously used for storing LPG. The product was removed in 1984 and the wells have been inactive since then. Small amounts of LPG are still present in the caverns and is now being bled off. The actual start of plugging operations will depend upon the time required to depressure the wells, but is now estimated to begin September 25 of this year. I have contacted Dermott Courtney, and will keep him informed as the schedule firms.

Sincerely,

Michael J. Schumacher
Minerals Development Engineer

MJS:fab
Enclosure

L2:JMALLECK

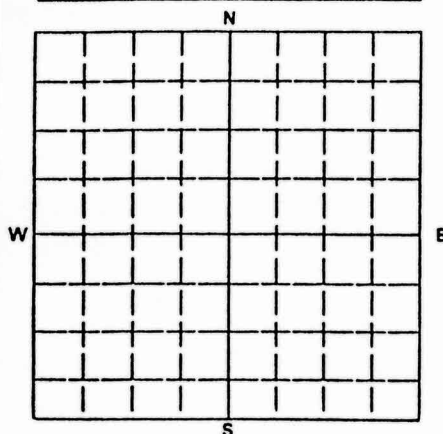
xc: James A. Loose - attachment
Gayle D. Petrick - attachment

Gordon Aitken
John A.C. Atkins

Akzo Salt Inc.
Abington
Executive Park
P O Box 352
Clarks Summit,
Pennsylvania
18411-0352
Phone and Fax:
717/587-5131
Cable: ISCO,
Clarks Summit, PA
Telex: 83-1872



PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY
Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891NAME AND ADDRESS OF OWNER/OPERATOR
Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 1600'S 42 25' Lat. 16200'W 76 50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

International
Lease Name Brine Wells

Well Number 37

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB./FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13-3/8	63		36'	
3-5/8	36		1882'	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☐
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8-5/8	8-5/8	8-5/8	8-5/8			
Depth to Bottom of Tubing or Drill Pipe (ft.)		1865		1325			
Sacks of Cement To Be Used (each plug)		133		376			
Slurry Volume To Be Pumped (cu. ft.)		157		444			
Calculated Top of Plug (ft.)		1400		Surf			
Measured Top of Plug (if tagged ft.)	1870		1330				
Slurry Wt. (Lb./Gal.)		15.6		15.6			
Type Cement or Other Material (Class III)	CastIron	ClassA	CastIron	ClassA			

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To
1350	1 355	Perforate & Squeeze	100 sks class 'A'

Estimated Cost to Plug Wells

\$24,000

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)
Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 37 - PLUGGING PROCEDURE

Background

Gallery No. 6

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	13-3/8"	35'
Production Casing	8-5/8"	1882'
Top of Salt		1969'

This well was drilled in 1964. It was used for water injection and brine production until 1977, when production was completed.

The condition of the casing is unknown, and no cement bond logs exist, so the casing will be perforated and cement squeezed above the Marcellus shale to ensure that this formation and those below it will remain positively isolated from shallow formations.

- - - -

Procedure

1. Depressure gallery 6 by closing in water injection to wells 35 and 38. Bleed brine from well 35 to the brine pond until the pressure stabilizes (at about 80 psi at Well 37).

Bleed brine from Well 38 or 41 back to the plant until the pressure on Well 37 falls to 0 psi.

2. Place a workover rig on the well. Remove the 6" valve and 7" X 8-5/8" swage from Well 37 and install a blowout preventer.
3. Run a 7-5/8" bit and scraper to 1880'.
4. Set a bridge plug on tubing in the 8-5/8" casing at 1870'; pull tubing up 10 feet.
5. Place 133 sacks of class 'A' cement on top of the plug, top of cement should be at about 1400'.
6. Pull tubing from the well and perforate the 8-5/8" casing at 1350', with 4 shots per foot over a 5-foot interval.
7. Attempt to pump fluid into the well. If perforations will not accept flow at a surface pressure of 500 psi, place cement from the existing top of cement to the surface.
8. If perforation will accept flow, set a cement retainer at 1330' and squeeze 100 sacks of class 'A' cement into the perforations. Pull out of the retainer and place cement from the top of the retainer to the surface.
9. Rig down and clean up the area.
10. Cut the casings off below grade and weld a plate over them.

- - - -



PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY
Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891NAME AND ADDRESS OF OWNER/OPERATOR
Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 550'S 42°25' Lat. 15100'W 76°50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

International

Lease Name Brine Wells

Well Number 27

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB./FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13-3/8	44		21	
8-5/8	36		2045	
5-1/2	15.5		1924	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☒
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	5-1/2	5-1/2					
Depth to Bottom of Tubing or Drill Pipe (ft.)							
Sacks of Cement To Be Used (each plug)		209					
Slurry Volume To Be Pumped (cu. ft.)		247					
Calculated Top of Plug (ft.)		Surf					
Measured Top of Plug (if tagged ft.)	1850						
Slurry Wt. (Lb./Gal.)		15.6					
Type Cement or Other Material (Class III)	Cast Iron	Class A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To

Estimated Cost to Plug Wells

\$10,00

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 27 - PLUGGING PROCEDURE

Background

Gallery No. 1

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	13-3/8"	21'
Production Casing	8-5/8"	2045'
Liner	5-1/2"	1924

This well was completed in 1957. It was used for LPG storage between 1964 and 1984. The well has not been used since the gallery was emptied of LPG in 1984.

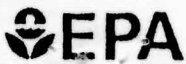
A 5-1/2" string was cemented in place in the 8-5/8" casing in 1978. A wireline cementing plug will be set near the bottom of this string and the well will be filled with cement.

- - - -

Procedure

1. Bleed off propane and brine as needed to depressure the well. Provide a 2" temporary brine line from the header to the wellhead to supply brine as needed to kill the well.
2. Rig up a wireline unit with a lubricator on top of the 6" TEE on the wellhead.
3. Pump a wiper plug down the well with 80 bbls of brine behind it to clean the 5-1/2" casing.
4. Set a wireline cementing plug in the 5-1/2" casing at 1850'.
5. Pump 209 sacks of class 'A' cement into the well with a rubber plug ahead of it.
6. Rig down and clean up the area.
7. Cut the casings off below grade and weld a plate over them.

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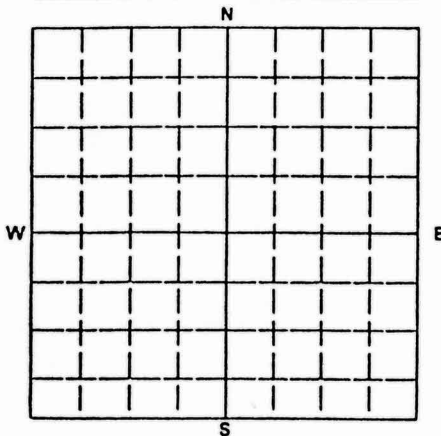


PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891

NAME AND ADDRESS OF OWNER/OPERATOR

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 450'S 42 25' Lat. 16150'W 76 50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

Lease Name International
Brine Wells

Well Number 28

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB./FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
14	--		49	
8-5/8	36		2616	
7	22.6		2590	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☐
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	7	7	7	7			
Depth to Bottom of Tubing or Drill Pipe (ft.)		1190		1275			
Sacks of Cement To Be Used (each plug)		121		239			
Slurry Volume To Be Pumped (cu. ft.)		143		282			
Calculated Top of Plug (ft.)		1350		Surf			
Measured Top of Plug (if tagged ft.)	2000		1280				
Slurry Wt. (Lb./Gal.)		15.6		15.6			
Type Cement or Other Material (Class III)	CastIron	ClassA	CastIron	ClassA			

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To
1300	1305	Perforate & Squeeze	100 sks class 'A'

Estimated Cost to Plug Wells

\$14,000

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 28 - PLUGGING PROCEDURE

Background

Gallery No. 1

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	14"	49'
Production Casing	8-5/8"	2616'
Production Casing	7"	2590'
Top of Salt		1909'

This well was completed in 1957. It was utilized as a water and brine well when Gallery No. 1 was used for LPG storage between 1964 and 1984. This well has not been used since 1984, and remaining salt reserves do not justify returning it to service.

A 7" liner was cemented in place inside the 8-5/8" casing in 1977. Because of the poor cement bond resulting from the small annular area between these casings, they will be perforated and cement will be squeezed to ensure isolation of the Marcellus Shale and deeper formations.

- - - -

Procedure

1. Bleed brine to the plant as necessary to depressure the cavern.
 2. Place a workover rig over the well. Remove the 6" valve and install a blowout preventer.
 3. Set a bridge plug on 2-7/8" tubing in the 7" casing at 2000'; pull the tubing up 10 feet.
 4. Place 121 sacks of class 'A' cement on the plug. Pull the tubing string out of the well.
 5. Perforate a 5-foot interval at 1300' with 4 shots per foot.
 6. Attempt to pump fluid into the perforations. If they will not accept flow at a surface pressure of 500 psi, place cement from 1300' to the surface.
 7. If the perforations will accept flow, set a cement retainer at 1280' and squeeze 100 sacks of class 'A' cement into the perforations. Pull out of the retainer and place cement from the top of the retainer to the surface.
 8. Rig down and clean up the area.
 9. Cut the casings off below grade and weld a plate over them.
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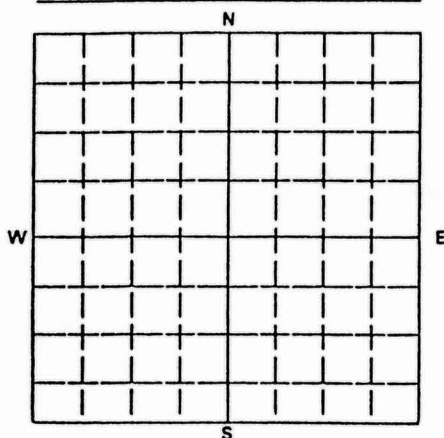


PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891

NAME AND ADDRESS OF OWNER/OPERATOR

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 650'S 42° 25' Lat. 15900'W 76° 50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

Lease Name International
Brine Wells

Well Number 46

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
16	65		152	
11-3/4	47		1492	
8-5/8	32		1897	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☐
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8-5/8	8-5/8					
Depth to Bottom of Tubing or Drill Pipe (ft.)		1845					
Sacks of Cement To Be Used (each plug)		536					
Slurry Volume To Be Pumped (cu. ft.)		633					
Calculated Top of Plug (ft.)		Surf					
Measured Top of Plug (if tagged ft.)	1850						
Slurry Wt. (Lb./Gal.)		15.6					
Type Cement or Other Material (Class III)	Cast Iron	Class A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To

Estimated Cost to Plug Wells

\$20,000

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 46 - PLUGGING PROCEDURE

Background

Gallery No. 1

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	16"	152'
Intermediate Casing	11-3/4"	1492'
Production Casing	8-5/8"	1897'
Tubing	7"	1886'
Top of Salt		1840'

This well was drilled in 1970 to recover LPG from a high point in the cavern. It was used for LPG movements until the gallery was emptied of product in 1984.

A 7" tubing string was placed in 1978. This string will be removed and cement will be placed in the 8-5/8" casing.

- - - -

Procedure

1. Rig up a temporary 2" line from the brine header to the well to provide brine if required to fill the well if the cement plug leaks.
2. Rig up a service rig over the well.
3. Plug the well back by pumping 100 sacks of 50/50 Pozmix cement into the well followed by a wiper plug and 75 barrels of brine. Allow to set up 24 hours, then bleed any pressure off.
4. If the pressure bleeds off quickly, tag the top of the cement with wireline. If the top of cement is above the bottom of the 7" tubing, install a blowout preventer and run a 6-1/4" bit down to clear the tubing before pulling it.
5. Lift the 7" string to release the packer, then set back down. If the annulus does not pressure up, lift the 7" string and strip a blowout preventer over it. Pull the 7" tubing from the well and lay down.
6. Set a bridge plug in the 8-5/8" casing at 1850' on 2-7/8" tubing. Pull the tubing up 5 feet.
7. Place class 'A' cement from the top of the plug to surface, staging as necessary to allow the workstring to be pulled from the well.
8. Rig down and clean up the area.
9. Cut the casings off below grade and weld a plate over them.

- - - -

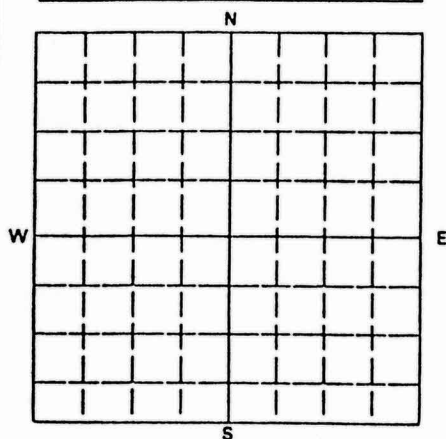


PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891

NAME AND ADDRESS OF OWNER/OPERATOR

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 600'S 42' 25' Lat. 17100'W 76' 50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

Lease Name International
Brine Wells

Well Number 30

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
16	-		74	
10-3/4	40.5		2506	
7	23		2480	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☐
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☒
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	7	7					
Depth to Bottom of Tubing or Drill Pipe (ft.)							
Sacks of Cement To Be Used (each plug)		460					
Slurry Volume To Be Pumped (cu. ft.)		543					
Calculated Top of Plug (ft.)		Surf					
Measured Top of Plug (if tagged ft.)	2460						
Slurry Wt. (Lb./Gal.)		15.6					
Type Cement or Other Material (Class III)	CastIron	ClassA					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To

Estimated Cost to Plug Wells

\$12,000

CERTIFICATION

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NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 30 - PLUGGING PROCEDURE

Background

Gallery No. 2

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	16"	74'
Production Casing	10-3/4"	2506'
Lining Casing	7"	2480'
Top of Salt		2080'

This well was drilled in 1958. It was used for LPG storage from 1964 to 1984. It has been idle since the cavern was emptied of product in 1984. A 7" liner was cemented inside the 10-3/4" casing in 1978.

A cementing plug will be set in the bottom of the inner casing and cement will be placed to the surface. The plug will be set by wireline to avoid exposure to LPG which may escape from the flat cavern roof.

- - - -

Procedure

1. Bleed off propane before beginning work. Provide a 2" temporary brine line from the header to the side of the wellhead to supply brine as needed to kill the well.
2. Rig up a wireline unit with a lubricator on top of the 6" crown valve.
3. Pump a wiper plug down the well with 120 barrels of brine to clean the 7" casing.
4. Set a wireline cementing plug in the 7" casing at 2460'.
5. Pump 460 sacks of class 'A' cement into the well with a rubber plug ahead of it.
6. Rig down and clean up the area.
7. Cut the casings off below grade and weld a plate over them.

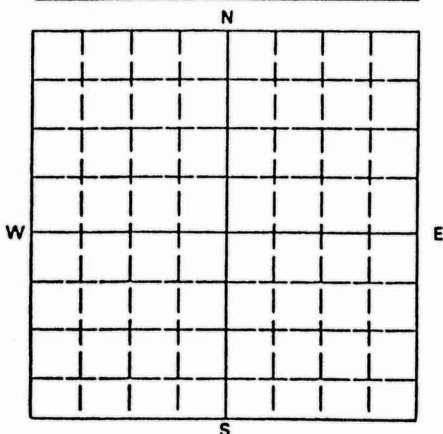


PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891

NAME AND ADDRESS OF OWNER/OPERATOR

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
SchuylerPERMIT NUMBER
NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 550'S 42 25' Lat. 16700'W 76 50' Long.

Location _____ ft. from (N/S) _____ Line of quarter section

and _____ ft. from (E/W) _____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells _____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

Lease Name International
Brine Wells

Well Number 31

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB./FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
8-5/8	36		120	
5-1/2	14		2366	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☐
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	5-1/2	5-1/2					
Depth to Bottom of Tubing or Drill Pipe (ft.)		1995					
Sacks of Cement To Be Used (each plug)		226					
Slurry Volume To Be Pumped (cu. ft.)		267					
Calculated Top of Plug (ft.)		Surf					
Measured Top of Plug (if tagged ft.)	2000						
Slurry Wt. (Lb./Gal.)		15.6					
Type Cement or Other Material (Class III)	Cast Iron	Class A					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To

Estimated Cost to Plug Wells

\$14,000

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 31 - PLUGGING PROCEDURE

Background

Gallery No. 2

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	8-5/8"	120'
Production Casing	5-1/2"	2366'
Tubing	4"	2013'
Top of Salt		2016'

This well was drilled in 1961 to be used in conjunction with Well 30. It was originally used for water and brine movements, but was used for LPG storage after Well 45 was completed in 1967. A 4" flush joint tubing string with a packer on the bottom was placed in the well in 1978.

The tubing string will be pulled from the well, then a bridge plug will be placed in the 5-1/2" string and cement placed to the surface.

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Procedure

1. Rig up a temporary 2" line from the brine header to the well to supply brine as needed to kill the well.
2. Rig up a service rig over the well.
3. Plug the well back by pumping 50 sacks of 50/50 Pozmix cement into the well followed by a wiper plug and 26 barrels of brine. Allow the cement to set up for 24 hours, then bleed any pressure off.
4. If the pressure bleeds off quickly, lift the 4" string to release the packer, then set back down. If the annulus does not pressure up, lift the 4" string and strip a blowout preventer over it. Pull the 4" tubing from the well and lay down.
5. Set a bridge plug in the 5-1/2" casing at 2000' on 2-7/8" tubing. Pull the tubing up 5 feet.
6. Place class 'A' cement from the top of the plug to the surface, staging as necessary to allow the workstring to be pulled from the well.
7. Rig down and clean up the area.
8. Cut the casings off below grade and weld a plate over them.

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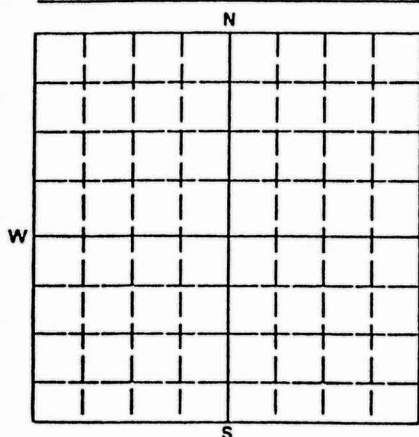


PLUGGING AND ABANDONMENT PLAN

NAME AND ADDRESS OF FACILITY

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891

NAME AND ADDRESS OF OWNER/OPERATOR

Akzo Salt Inc.
Salt Point Road
Watkins Glen, NY 14891LOCATE WELL AND OUTLINE UNIT ON
SECTION PLAT — 640 ACRESSTATE
NYCOUNTY
Schuyler

PERMIT NUMBER

NYU 63860

SURFACE LOCATION DESCRIPTION Reading 7-1/2 Quad

1/4 OF 1/4 OF 1/4 SECTION TOWNSHIP RANGE

LOCATE WELL IN TWO DIRECTIONS FROM NEAREST LINES OF QUARTER SECTION AND DRILLING UNIT

Surface 750'S 42° 25' Lat. 16900'W 76° 50' Long.

Location ____ ft. from (N/S) ____ Line of quarter section

and ____ ft. from (E/W) ____ Line of quarter section

TYPE OF AUTHORIZATION

- ☐
- Individual Permit
-
- ☒
- Area Permit
-
- ☐
- Rul.

Number of Wells ____

WELL ACTIVITY

- ☐
- CLASS I
-
- ☐
- CLASS II
-
- ☐
- Brine Disposal
-
- ☐
- Enhanced Recovery
-
- ☐
- Hydrocarbon Storage
-
- ☒
- CLASS III

Lease Name International
Brine Wells

Well Number 45

CASING AND TUBING RECORD AFTER PLUGGING

SIZE	WT(LB/FT)	TO BE PUT IN WELL (FT)	TO BE LEFT IN WELL (FT)	HOLE SIZE
13-3/8	48		218	
8-5/8	32		2816	

METHOD OF EMPLACEMENT OF CEMENT PLUGS

- ☒
- The Balance Method
-
- ☐
- The Dump Bailer Method
-
- ☐
- The Two-Plug Method
-
- ☐
- Other

CEMENTING TO PLUG AND ABANDON DATA:

	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Size of Hole or Pipe in which Plug Will Be Placed (inches)	8-5/8	8-5/8					
Depth to Bottom of Tubing or Drill Pipe (ft.)		2275					
Sacks of Cement To Be Used (each plug)		660					
Slurry Volume To Be Pumped (cu. ft.)		780					
Calculated Top of Plug (ft.)		Surf					
Measured Top of Plug (if tagged ft.)	2280						
Slurry Wt. (Lb./Gal.)		15.6					
Type Cement or Other Material (Class III)	CastIron	ClassA					

LIST ALL OPEN HOLE AND/OR PERFORATED INTERVALS AND INTERVALS WHERE CASING WILL BE VARIED (If any)

From	To	From	To

Estimated Cost to Plug Wells

\$19,000

CERTIFICATION

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)

NAME AND OFFICIAL TITLE (Please type or print)

Michael J. Schumacher
Minerals Development Engineer

SIGNATURE

DATE SIGNED

9/11/89

WELL 45 - PLUGGING PROCEDURE

Background

Gallery No. 2

	<u>Size</u>	<u>Setting Depth</u>
Surface Casing	13-3/8"	218'
Production Casing	8-5/8"	2816'
Tubing	7"	2290'
Tubing	5-1/2"	585'
Top of Salt		2054'

This well was drilled in 1967 and was used as a water and brine well while Gallery No. 2 was used for LPG storage up to 1984.

A 7" liner was put in the well in 1978, and the 7" and 8-5/8" strings were perforated at a depth of 535' in 1982. A 5-1/2" tubing was placed in the well with a packer to isolate the perforated area.

The tubing string will be removed, a bridge plug will be set in the bottom of the casing, and cement will be placed to the surface.

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Procedure

1. Verify depressurization of tubing, 5-1/2" X 7" annulus, and 7" X 8-5/8" annulus. Run a temporary 2" line from the brine header to the well to supply brine, if required to kill the well.
2. Set a service rig over the well and remove top valve.
3. Pull the 5-1/2" string and lay down.
4. Lift 7" string and strip blowout preventer over it.
5. Pull the 7" string and lay down.
6. Set a bridge plug on 2-7/8" tubing in the 8-5/8" casing at 2280' and pull up 5 feet.
7. Pump 660 sacks of class 'A' cement into the well through the tubing, staging as necessary to avoid cementing the tubing in the hole.
8. Rig down and clean up the area.
9. Cut the casings off below grade and weld a plate over them.

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